

**ABSTRACT**

A waveguide configuration comprising a core, at least one cladding and a buffer. The core includes Al and Yb. The respective amount Yb in the divalent state is such that any indirect and direct losses of Yb in the divalent state are exceeded by the gain attributable to Yb in the trivalent state. The at least one cladding extends about the core. The at least one buffer extends about the outermost of the at least one cladding.